

Remarks***Status of the Claims***

Claims 1 – 21 were original in the application. Claims 1 – 10 have been withdrawn. Claim 11 has been amended. Therefore, claims 11 – 21 are submitted for examination on the merits.

Claim Rejections - 35 USC § 102

Claims 11 - 21 were rejected as being anticipated by **Deliwala**, U.S. Patent Application 2003/0039430. The Examiner cited **Deliwala** as disclosing a tapered optical coupling comprising the following features:

- a substrate 9012, see Figures 82-86 and para. 451-474, or Fig. 72, 66;
- a slab waveguide 9014 on or in the substrate 9012, para. 451-453,
- a funnel-shaped termination 9034/9024 (horn and channel) on or in said substrate 9012 which is optically coupled to the waveguide 9014;
- a photonic crystal 9022 which is optically coupled to slab waveguide 9014, para. 453,455,456,
- where the slab waveguide 9014 is integral with photonic crystal 9022,
- where the funnel-shaped termination 9034/9024 is optically coupled to optic fiber, para.452,
- where the funnel-shaped termination is formed by shadow

deposition (with no patentable weight given on process limitation see MPEP 2173.05(p)),

- where the funnel-shaped termination composed of material having an index of refraction approximately matching the slab waveguide, para. 464+, 456, 354, 165,
- where the funnel-shaped termination is composed of poly crystalline silicon, para. 448, 409, 404,
- where the slab waveguide is composed of GaAs, para. 120, 168,
- where the funnel-shaped termination is a half-funnel shape (one or two dimensional waveguide, para.455-456),
- where the funnel-shaped termination is a full-funnel shape (three dimensional waveguide, para. 457), where the funnel-shaped termination comprises a surface for optical coupling inclined with respect to said substrate (two or three dimensional waveguide), figs. 82, 84-85 and 86.
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Turn to claim 1 as amended. **Deliwala** fails to disclose the claimed device by failing to show a termination which provides a funnel shape in two dimensions orthogonal to the waveguide axis. **Deliwala's** termination is a complex multiply layered stack of dielectric layers and short pillars, which are shown as funnel shaped only in one dimension, namely the dimension in the plane of Fig. 85, which we may label as the xy plane. In the dimension of the plane of Fig. 87, which we may label as the xz plane, waveguide 9014 is shown explicitly **not** to be funnel shaped. In fact the shape in the orthogonal plane of Fig. 87 is entirely

rectangular or prismatic. There is no disclosure whatsoever in **Deliwala** enabling one to make any such structure. Hence, **Deliwala** fails to anticipate each and every element of claim 11 as amended.

Claims 12 – 21 depend directly or indirectly on claim 11 and are allowable therewith and for such further limitations as each claim may further include.

Claims 11, 14, 18 and 20 are rejected as being anticipated by **Meade et al.** U.S. Patent 5,526,449. The Examiner cited **Meade** for disclosing a tapered optical coupling comprising:

a substrate 102, see figure 12, col. 10, lines 23+,

a slab waveguide 110 on or in the substrate 102,

a funnel-shaped termination 120 on or in said substrate 102 and optically coupled to the waveguide 110/114, which funnel-shaped termination 120 is optically coupled to optic fiber 112,

where slab waveguide 110 is composed of GaAs 202, col. 7, lines 60+; and

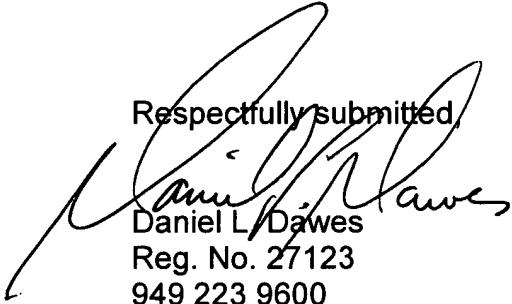
where funnel-shaped termination 120 is a full funnel shape.

It is not clear what the Examiner means by characterizing termination 120 as a “full” funnel shape. Fig. 12 of **Meade** which is cited shows only a plan top view of termination 120, which does not establish that termination 120 is funnel-shaped in two orthogonal dimensions to the waveguide axis. A careful examination of **Meade** confirms that termination 120 is only described as a two

dimensional taper and there is no enabling disclosure whatsoever that it is or how it could possibly be made to be funnel-shaped in two orthogonal dimensions to the waveguide axis. Hence, **Meade** fails to anticipate each and every element of claim 11 as amended.

Advancement of the claims as amended to allowance is respectfully requested.

Respectfully submitted,



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